CLAIMS

We claim:

1. A method for producing a three-dimensional map of fracture locations and characteristics in a geological basin, the method comprising:

collecting data pertaining to characteristics of the geologic basin;

simulating rock rheology by integrating continuous deformation with fracture, fault, gouge, and pressure solutions;

simulating mechanical processes to coevolve deformation with multi-phase flow, petroleum generation, mineral reactions, and heat transfer to predict the location and producibility of fracture sweetspots;

adjusting the predictions to reduce their deviation from the collected data; and

integrating the resulting predictions with the collected data to construct maps of high-grading zones of fracture producibility.

2. The method of claim 1 wherein collecting data includes collecting data in the set: well log data, surface data, core data, seismic data.

3. A computer-readable medium having instructions for performing the method of claim 1.